**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**In re Application of:**

Tranter *et al.*

**Serial No.:** 10/656,028

**Filed:** September 4, 2003

**For:** HIGH CAPACITY ADSORPTION MEDIA FOR SEPARATING OR REMOVING CONSTITUENTS AND METHODS OF PRODUCING AND USING THE ADSORPTION MEDIA

**Confirmation No.:** 8489

**Examiner:** E. Johnson

**Group Art Unit:** 1754

**Attorney Docket No.:** B-379

**PRE-APPEAL BRIEF**

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Pre-Appeal Brief is filed in response to the Examiner's remarks in the Final Office Action ("Final Office Action") mailed June 23, 2006. This Pre-Appeal Brief is submitted in accordance with the requirements of the Pre-Appeal Brief Conference Pilot Program (*see* 1296 Off. Gaz. Pat. Office 67, July 12, 2005) and is submitted concurrently with a Notice of Appeal and Pre-Appeal Brief Request for Review.

## REMARKS

Claims 1-16 and 22-27 are currently pending in the application and stand rejected. Applicants submit that there are clear errors in the rejection of the pending claims and that the Examiner has omitted one or more essential elements needed for a *prima facie* rejection.

Claims 1-16 and 22-27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,232,265 to Bruening *et al.* ("Bruening"). The teachings of Bruening are summarized on p. 7 of Applicants' response filed on December 16, 2005. The pending claims are directed, generally, to methods of producing an adsorption medium and to an adsorption medium having increased metal loading.

The Examiner has relied predominantly on Example 3 of Bruening as teaching the limitations of independent claims 1, 22, and 25. However, Bruening does not teach or suggest the limitations in claim 1 of "dissolving polyacrylonitrile (PAN) into the metal solution to form a PAN-metal solution" and "depositing the PAN-metal solution into a quenching bath to form an adsorption medium comprising PAN and at least one metal hydroxide." Bruening also does not teach or suggest the limitations in claim 25 of "dissolving PAN in an organic solvent to form a PAN solution" and "depositing the metal oxide-PAN solution into a quenching bath to form an adsorption medium comprising PAN and at least one metal hydroxide."

As explained on p. 8-14 of Applicants' response filed on December 16, 2005, while Bruening teaches acrylonitrile, polymerized acrylonitrile, Ag/KOH, and water, Bruening does not teach or suggest the above-mentioned method limitations of claims 1 and 25. Applicants do not dispute that Bruening teaches the above-mentioned chemical compounds. Rather, Applicants dispute that Bruening teaches the above-mentioned method limitations of claims 1 and 25, which recite more than mere chemical compounds. The Examiner relies on the mere mention of these chemical compounds in Bruening as support for teaching the method limitations of claims 1 and 25. However, the Examiner overlooks the additional language recited in these method limitations.

Example 3 of Bruening teaches, *inter alia*, that pentaerythritol and acrylonitrile are reacted to form a tetranitrile product (labeled 3B in Example 3). Ag/KOH is used as a catalyst for the reaction. The tetranitrile product is poured into water, allowing excess acrylonitrile to

polymerize. The polymerized acrylonitrile is filtered from the reaction mixture, while the tetranitrile product is washed, dried, and further reacted to form tetrakis (5-amino-2-oxa-pentyl)methane.

While Bruening teaches that polymerized acrylonitrile is produced, the polymerized acrylonitrile is not dissolved into a metal solution to form a PAN-metal solution. Since the polymerized acrylonitrile is removed from the tetranitrile product by filtration, the polymerized acrylonitrile must be a solid. As such, it is improper to characterize the polymerized acrylonitrile as being dissolved in a metal solution and forming a PAN-metal solution. In addition, when the acrylonitrile is present with the pentaerythritol and Ag/KOH, the acrylonitrile is not polymerized and, therefore, is not properly characterized as PAN. Therefore, Bruening does not teach or suggest the limitation of "dissolving PAN into the metal solution to form a PAN-metal solution" as recited in claim 1 and "dissolving PAN in an organic solvent to form a PAN solution" as recited in claim 25.

The Examiner states that "one of ordinary skill would expect at least some polymerized acrylonitrile and KOH to remain in the disclosed selective binding composition." Final Office Action, p. 2. However, this statement is conclusory and is not supported by any evidence of record.

Bruening also does not teach or suggest the limitation of "depositing the PAN-metal solution into a quenching bath to form an adsorption medium comprising PAN and at least one metal hydroxide," as recited in claim 1, or "depositing the metal oxide-PAN solution into a quenching bath to form an adsorption medium comprising PAN and at least one metal hydroxide," as recited in claim 25. While Bruening teaches pouring a mixture of pentaerythritol and acrylonitrile into water, any acrylonitrile that has not reacted with the pentaerythritol to form the tetranitrile product is still in monomeric form. In other words, the mixture of pentaerythritol and acrylonitrile, before it is added to the water, does not include PAN. As such, it is improper for the Examiner to characterize the mixture as a PAN-metal solution that is deposited into a quenching bath. Furthermore, Bruening does not teach or suggest that pouring the mixture of pentaerythritol and acrylonitrile into a quenching bath forms an adsorption medium that comprises PAN and at least one metal hydroxide. While polymerized acrylonitrile is produced as a by-product during the process, Bruening does not teach or suggest that its particulate solid

support includes PAN and at least one metal hydroxide for the reasons explained below.

The Examiner acknowledges that Bruening does not teach or suggest the "depositing" limitation of each of claims 1 and 25 but states that "[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to deposit and form an adsorption medium because Bruening discloses particulate solid 'supports', which would motivate depositing onto the disclosed support and also because Bruening discloses making a 'selectively binding' particulate composition, which would motivate forming an adsorption medium." Final Office Action, p. 2-3. However, this statement by the Examiner is conclusory and is not based on objective evidence of record. The Examiner overlooks the fact that the particulate solid support of Bruening does not include polymerized acrylonitrile. Rather, the polymerized acrylonitrile is a by-product of one of the reactions described in Example 3 and is removed before performing additional reactions that produce the particulate solid support. Since the polymerized acrylonitrile is removed from the reaction mixture, Bruening does not provide any suggestion to use the polymerized acrylonitrile in its particulate solid support.

Bruening also does not teach or suggest all of the limitations of claim 22. Specifically, Bruening does not teach or suggest that its particulate solid support includes "a PAN matrix." The Examiner states that Bruening teaches this limitation because "Bruening '265 discloses 42.45g polymerized acrylonitrile." Final Office Action, p. 3. However, this characterization of Bruening is incorrect because column 9, lines 25-28 of Bruening teaches 42.45 g of acrylonitrile, not polymerized acrylonitrile. The Examiner is relying on the mere mention of acrylonitrile or polymerized acrylonitrile in Bruening as teaching this limitation but is overlooking the fact that the polymerized acrylonitrile is not present in the particulate solid support for the reasons previously described.

Bruening also does not teach or suggest that its particulate solid support includes "at least one metal hydroxide" as recited in claim 22. While Ag/KOH is used as a catalyst to prepare the tetranitrile product, Bruening does not teach or suggest that the KOH is present in its particulate solid support. Again, the Examiner is relying on the mere mention of Ag/KOH in Bruening as teaching this limitation but overlooks the fact that Ag/KOH is not present in the particulate solid support.

The Examiner also states that "it would have been obvious to one of ordinary skill in the

art . . .to use 10-85% elemental metal because Bruening '265 discloses 40% Ag/KOH, and removal by filtration, which would obviously, to one of ordinary skill, motivate 10-85% of after removal of liquid by filtration with a balance of polyacrylonitrile." Final Office Action, p. 3. However, as explained above, the Ag/KOH is not present in the particulate solid support of Bruening.

In summary, the Examiner appears to base the obviousness rejection on the fact that certain chemical compounds are taught in Bruening. However, the Examiner overlooks the fact that the method limitations recited in the claims are not taught or suggested. In essence, the Examiner appears to ignore the language of the method limitations claims and, instead, focuses on the presence of the chemical compounds.

## CONCLUSION

Applicants submit that the Examiner's rejections are clearly erroneous and that the Examiner has not satisfied his burden in setting forth a *prima facie* rejection of claims 1-16 and 22-27. Applicants respectfully request that the rejection of independent claims 1, 22, and 25 be reversed on the above-identified grounds. Dependent claims 2-16, 23, 24, 26, and 27 are allowable, *inter alia*, as depending from allowable base claims.

Respectfully submitted,

/Stephen R. Christian/

Stephen R. Christian
Registration No. 32,687
Attorney for Applicants
P.O. Box 1625
Idaho Falls, ID 83415-3899
Phone: (208) 526-9140
Fax: (208) 526-8339

Date: 21 August 2006

Doc Code: AP.PRE.REQ

PTO/SB/33 (07-05)
Approved for use through xx/xx/200x. OMB 0651-00xx
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

# PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional): B-378

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)]

on _____

Signature _____

Typed or printed name: Kathy Harris

| Application Number | Filed |
|---|---|
| 10/656,028 | September 4, 2003 |

First Named Inventor: Tranter et al.

| Art Unit | Examiner |
|---|---|
| 1754 | S. Johnson |

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

- [ ] applicant/inventor.
- [ ] assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)
- [X] attorney or agent of record. Registration number 32,687
- [ ] attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____

Signature

Stephen R. Christian
Typed or printed name

(208) 526-9140
Telephone number

21 AUG 2006
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

- [ ] *Total of _____ forms are submitted.

This collection of information is required by 35 U.S.C. 132. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*